K102607

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Premarket Notification
510(k) Summary
FIDIS™ CONNECTIVE 10 Assay kit and Multiparameters quality control

Assigned 510(k) Number:

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2) Device Name

Trade/Proprietary Name : **FIDIS™ CONNECTIVE 10 Assay kit**

Classification Names: Antinuclear Antibody Immunological Test System

Common/Usual Name : **MX006 – MX506 - FIDIS™ CONNECTIVE 10**: Detection test for autoantibodies directed against dsDNA, SS-A (60kDa and TRIM 21 (SS-A 52kDa), SS-B, Sm, Sm/RNP, Scl-70, Jo-1, ribosomes and centromere (CENP-B).

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Trade/Proprietary Name : **FIDIS™ Analyzer**

Classification Name: Instrumentation for Chemical Multiplex Systems

Trade/Proprietary Name : **CARIS™ System**

Classification Name: Device, Microtiter diluting/Dispensing

3) Legally marketed equivalent device

510K Number	Device Classification Name	Manufacturer Name
K071210	**FIDIS™ CONNECTIVE 10**	Biomedical Diagnostics S.A.(bmd)

4) Device description

FIDIS™ CONNECTIVE 10 kit is a multiplex flow immunoassay, which allows simultaneous identification and detection of several antibodies.

FIDIS™ CONNECTIVE 10 is based on the use of distinct uniform size color-coded microsphere sets and a benchtop flow cytometer interfaced to digital signal processing hardware and software. A red diode laser beam in the flow cytometer recognizes each set of microspheres on the basis of its unique fluorescence intensity (red and infrared) thus identifying which parameter is being tested. At the same time, a green laser beam illuminates the external second molecule fluorescence to quantify the reaction related to the specific antigen.

Ten different fluorescently "colored" sets of microspheres are coated with antigens associated with various connective diseases (dsDNA, SS-A (60kDA and TRIM 21 (SS-A 52kDa)), SS-B, Sm, Sm/RNP, Scl-70, Jo-1, ribosomes and centromere). An additional microsphere (Internal Bead standard) set is coated with anti-IgG to ensure that false negative results due to operational error are detected.
The eleven different sets of microspheres are mixed together. The mixture is lyophilized and constitutes the final microspheres reagent.

The test is performed using a 96 wells microplate with a filtering membrane at the bottom of the wells.

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⇨ In the first step, the sample is distributed in each well containing the reconstituted microspheres mixture, allowing any anti-dsDNA, anti-SS-A (60kDa and TRIM 21 (SS-A 52kDa)), anti-SS-B, anti-Sm, anti-Sm/RNP, anti-Scl-70, anti-Jo-1, anti-ribosomes and anti-centromere antibodies present to bind to the immobilized antigens on the microspheres, as well as free IgG to bind to the anti-IgG microsphere.
⇨ After incubation, a wash step using a filtration process removes the unbound antibodies.
⇨ A phycoerythrin anti-human IgG conjugate is then added that binds to the previously bound antibodies.
⇨ A final wash step stops the reaction and eliminates the unbound conjugate.
⇨ The reaction is then measured directly by the flow cytometer, which distinguishes each set of microspheres by its fluorescence color while simultaneously measuring the average fluorescence emitted by the conjugate.
⇨ A calibration system allows the determination of the titer (AU/mL) of each sample by interpolation for each antigenic specificity.

Kit components

	MX006	MX506
96 wells microplate with filtering membrane and lid. **MP**	1 plate	5 plates
Vial **(A)** of color-coded microsphere set of 10 sensitized by dsDNA, SS-A 60 kDa, TRIM 21 (SS-A 52 kDa), SS-B, Sm, Sm/RNP, Scl-70, Jo-1, ribosomes and CENP-B antigen(s). Lyophilized (to be reconstituted with the buffer named D) **MICROSPHERES**	qs 6mL	5 x qs 6mL
Vial **(B1)** of sample dilution buffer (white vial) Ready to use **DIL SPE**	2 x 115mL	10 x 115mL
Vial of calibrator* Ready to use ***Each titer is printed on the vial label*** **CAL**	1 x 1,5mL	5 x 1.5mL
Vial of positive control concentrated. This control has a standard reactivity, which provides evidence of the proper reagents activity and proper assay performance. To be diluted ***Expected values are printed on the vial label.*** **CONTROL +**	1 x 250 µL	5 x 250µL
Vial of negative control concentrate To be diluted **CONTROL -**	1 x 250µL	5 x 250µL
Vial of anti-human IgG coupled to phycoerythrin Ready to use **CONJ IgG**	1 x 12mL	5 x 12mL
Vial **(C1)** of washing buffer (black vial) Ready to use **BUF WASH**	1 x 100mL	5 x 100mL
Vial **(D)** of reconstitution buffer for the microsphere set Ready to use **BUF MICROSPHERES**	1 x 6mL	5 x 6mL

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5) Intended use

FIDIS™ CONNECTIVE 10 Assay kit

The **FIDIS™ CONNECTIVE 10*** kit is a semi-quantitative homogeneous fluorescent-based microparticles immunoassay using flow cytometry. The test system is used to simultaneously detect the presence of 10 autoantibody specificities: double stranded DNA (dsDNA), SS-A (60kDa and TRIM 21 (SS-A 52kDa)), SS-B, Sm, Sm/RNP, Scl-70, Jo-1, ribosomes and centromere (CENP-B).

*(*Antibodies to dsDNA, Sm, Sm/RNP, SS-A, SS-B, Scl-70, Jo-1, ribosomes and CENP-B can be reported using this assay).*

Clinical utility:

The results of the **FIDIS™ CONNECTIVE 10** are to be used in conjunction with the clinical findings and the other laboratory tests to aid in the diagnosis of connective diseases (systemic lupus erythematosus (SLE), Sjogren's syndrome, mixed connective tissue disease (MCTD), scleroderma, dermatomyositis and CREST syndrome).

FIDIS™ CONNECTIVE 10 kit uses serum only, and is to be run on the FIDIS™ Instrument and MLX-BOOSTER™ Software.

FIDIS™ CONNECTIVE 10 kit may be used with the **CARIS™ system** (diluting and dispensing device).

This kit is for *In vitro* diagnostic use.

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6) Technological characteristics

The following table summarizes similarities and differences between the modified **FIDIS™ CONNECTIVE 10 and the predicate device FIDIS™ CONNECTIVE 10 (K071210).**

Comparison with the predicate

		Predicate Device FIDIS™ CONNECTIVE 10 K071210	Modified Device FIDIS™ CONNECTIVE 10
Intended use		Individual determination in human serum of IgG antibodies against: dsDNA, SSA 60kDa, SSA 52kDa, SSB, Sm, Sm/RNP, Scl70, Jo-1, Ribosome and centromere	(Minor text change) Individual determination in human serum of IgG antibodies against: dsDNA, SS-A 60kDa, TRIM 21 (SS-A 52kDa), SS-B, Sm, Sm/RNP, Scl-70, Jo-1, Ribosomes and centromere
CUT-OFF	**Negative**	<30 for the 10 specificities - In IU/mL for dsDNA - In AU/mL for the 9 other specificities	Same
	Equivocal	30-40 for the 10 specificities	Same
	Positive	>40 for the 10 specificities	Same
Beads		Vial of color-coded microsphere set Lyophilized (Sufficient quantity to obtain 6mL after reconstitution)	Same
Sample dilution		Sample dilution buffer ready to use **(B)**	(Minor text change) Sample dilution buffer ready to use **(B1)**
Washing buffer		Washing buffer ready to use **(C)**	(Minor text change) Washing buffer ready to use **(C1)**
Internal standard beads		Yes	Same
Reconstitution buffer for the microsphere set		Vial **(D)** of reconstitution buffer for the microsphere set Ready to use (6mL)	Same
Assay configuration		1 "reagent-blank" well 1 "negative control" well 1 "positive control" well 2 "calibrator" wells	Same
		Diluted sample wells	Same
Incubation time		2 x 30min. RT	Same
Assay protocol		Final wash step	Same
Software		MLX-Booster Version 2.2	Same
Assay technology		Flow cytometry	Same
Number of reading microspheres per parameter		200	100
Reading time		60 seconds	90 seconds
Microplate sealing films		6	No
Sample delivery		Manual pipetting	Same
Automated sample delivery (option)		CARIS™ (pipettor)	Same

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7) Performance Characteristics

7.1. Precision study – Using Manual Pipetting

Precision of the assay was assessed in **using 6 samples for** each of 7 analytes (dsDNA, SS-A 60kDa & TRIM 21 (SS-A 52 kDa), SS-B, Sm, Sm/RNP, Jo-1 and CENP-B) and only in **using 5 samples** for Scl-70 and Ribosomes. Precision was determined by calculating the within-run (intra-assay) and the between-run (inter-assay).

- For within-run: 10 tests in a same run.
- For between-run: 5 runs, 1 test per run.

Table 1: Summary of FIDIS™ CONNECTIVE 10 precision results using Manual Pipetting

Sample range	dsDNA, SS-A 60kDa & TRIM 21 (SS-A 52 kDa), SS-B, Sm, Sm/RNP, Scl-70, Jo-1, Ribosomes and Centromere analytes			
	Within-run		Between-run	
	Minimal %CV	Maximal %CV	Minimal %CV	Maximal %CV
≤ 29 AU/mL or IU/mL	4%	15%	6%	15%
30 to 400 AU/mL or IU/mL	1%	10%	3%	15%

7.2. Comparison study with predicate – Using Manual Pipetting

bmd has compared the results obtained with **modified FIDIS™ CONNECTIVE 10** versus the results obtained with **predicate FIDIS™ CONNECTIVE 10 K071210**.

The study was performed on 80 samples characterized with the predicate test and the result repartition is described below:

- **77 samples were positive** for one or more parameters (see table 3)
- **3 negative samples.**

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a. *First set of measures based on included the equivocal results with the test negative results.*

⇨ dsDNA

dsDNA		PREDICATE FIDIS™ CONNECTIVE 10 K071210		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10	Pos	16	1	17
	Neg	0	63	63
	Total	16	64	80

There was 1 equivocal result with the assay. For purposes of calculation, this result was considered to be negative.
- **Positive percent agreement: 100% (16/16)**
- **Negative percent agreement: 98.4% (63/64)**
- **Overall agreement: 98.8% (79/80)**

⇨ SS-A 60kDa

SS-A 60kDa		PREDICATE FIDIS™ CONNECTIVE 10 K071210		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10	Pos	25	1	26
	Neg	0	54	54
	Total	25	55	80

There were 4 equivocal results with the assay. For purposes of calculation, these results were considered to be negative.
- **Positive percent agreement: 100% (25/25)**
- **Negative percent agreement: 98.2% (54/55)**
- **Overall agreement: 98.8% (79/80)**

⇨ TRIM 21 (SS-A 52kDa)

TRIM 21 (SS-A 52kDa)		PREDICATE FIDIS™ CONNECTIVE 10 K071210		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10	Pos	23	0	23
	Neg	1	56	57
	Total	24	56	80

There were 3 equivocal results with the assay. For purposes of calculation, these results were considered to be negative.
- **Positive percent agreement: 95.8% (23/24)**
- **Negative percent agreement: 100% (56/56)**
- **Overall agreement: 98.8% (79/80)**

⇨ SS-B

SS-B		PREDICATE FIDIS™ CONNECTIVE 10 K071210		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10	Pos	14	1	15
	Neg	0	65	65
	Total	14	66	80

There were 5 equivocal results with the assay. For purposes of calculation, these results were considered to be negative.
- **Positive percent agreement: 100% (14/14)**
- **Negative percent agreement: 98.5% (65/66)**
- **Overall agreement: 98.8% (79/80)**

⇨ Sm

Sm		PREDICATE FIDIS™ CONNECTIVE 10 K071210		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10	Pos	17	0	17
	Neg	0	63	63
	Total	17	63	80

There was 1 equivocal result with the assay. For purposes of calculation, this result was considered to be negative.
- **Positive percent agreement: 100% (17/17)**
- **Negative percent agreement: 100% (63/63)**
- **Overall agreement: 100% (80/80)**

⇨ Sm/RNP

Sm/RNP		PREDICATE FIDIS™ CONNECTIVE 10 K071210		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10	Pos	19	1	20
	Neg	0	60	60
	Total	19	61	80

There were 3 equivocal results with the assay. For purposes of calculation, these results were considered to be negative.
- **Positive percent agreement: 100% (19/19)**
- **Negative percent agreement: 98.4% (60/61)**
- **Overall agreement: 98.8% (79/80)**

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⇨ Scl-70

Scl-70		PREDICATE FIDIS™ CONNECTIVE 10 K071210		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10	Pos	15	2	17
	Neg	0	63	63
	Total	15	65	80

There were 2 equivocal results with the assay. For purposes of calculation, these results were considered to be negative.
- **Positive percent agreement: 100% (15/15)**
- **Negative percent agreement: 96.9% (63/65)**
- **Overall agreement: 97.5% (78/80)**

⇨ Jo-1

Jo-1		PREDICATE FIDIS™ CONNECTIVE 10 K071210		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10	Pos	10	0	10
	Neg	0	70	70
	Total	10	70	80

There were 2 equivocal results with the assay. For purposes of calculation, these results were considered to be negative.
- **Positive percent agreement: 100% (10/10)**
- **Negative percent agreement: 100% (70/70)**
- **Overall agreement: 100% (80/80)**

⇨ CENP-B

CENP-B		PREDICATE FIDIS™ CONNECTIVE 10 K071210		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10	Pos	7	1	8
	Neg	0	72	72
	Total	7	73	80

There was 1 equivocal result with the assay. For purposes of calculation, this result was considered to be negative.
- **Positive percent agreement: 100% (7/7)**
- **Negative percent agreement: 98.6% (72/73)**
- **Overall agreement: 98.8% (79/80)**

⇨ Ribosomes

Ribosomes		PREDICATE FIDIS™ CONNECTIVE 10 K071210		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10	Pos	6	0	6
	Neg	0	74	74
	Total	6	74	80

There was 1 equivocal result with the assay. For purposes of calculation, this result was considered to be negative.
- **Positive percent agreement: 100% (6/6)**
- **Negative percent agreement: 100% (74/74)**
- **Overall agreement: 100% (80/80)**

b. Second set of measures based on included the equivocal results with the test positive results.

⇨ dsDNA

dsDNA		PREDICATE FIDIS™ CONNECTIVE 10 K071210		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10	Pos	17	0	17
	Neg	0	63	63
	Total	17	63	80

There was 1 equivocal result with the assay. For purposes of calculation, this result is considered to be positive.
- **Positive percent agreement: 100% (17/17)**
- **Negative percent agreement: 100% (63/63)**
- **Overall agreement: 100% (80/80)**

⇨ SS-A 60kDa

SS-A 60kDa		PREDICATE FIDIS™ CONNECTIVE 10 K071210		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10	Pos	29	0	29
	Neg	0	51	51
	Total	29	51	80

There were 4 equivocal results with the assay. For purposes of calculation, these results were considered to be negative.
- **Positive percent agreement: 100% (29/29)**
- **Negative percent agreement: 100% (51/51)**
- **Overall agreement: 100% (80/80)**

⇨ TRIM 21 (SS-A 52kDa)

TRIM 21 (SS-A 52kDa)		PREDICATE FIDIS™ CONNECTIVE 10 K071210		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10	Pos	25	1	26
	Neg	0	54	54
	Total	25	55	80

There were 3 equivocal results with the assay. For purposes of calculation, these results were considered to be negative.
- **Positive percent agreement: 100% (25/25)**
- **Negative percent agreement: 98.2% (54/55)**
- **Overall agreement: 98.8% (79/80)**

⇨ SS-B

SS-B		PREDICATE FIDIS™ CONNECTIVE 10 K071210		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10	Pos	19	0	19
	Neg	0	61	61
	Total	19	61	80

There were 5 equivocal results with the assay. For purposes of calculation, these results were considered to be negative.
- **Positive percent agreement: 100% (19/19)**
- **Negative percent agreement: 100% (61/61)**
- **Overall agreement: 100% (80/80)**

⇨ Sm

Sm		PREDICATE FIDIS™ CONNECTIVE 10 K071210		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10	Pos	18	0	16
	Neg	0	62	64
	Total	17	63	80

There was 1 equivocal result with the assay. For purposes of calculation, this result is considered to be positive.
- **Positive percent agreement: 100% (18/18)**
- **Negative percent agreement: 100% (62/62)**
- **Overall agreement: 100% (80/80)**

⇨ Sm/RNP

Sm/RNP		PREDICATE FIDIS™ CONNECTIVE 10 K071210		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10	Pos	20	1	21
	Neg	1	58	59
	Total	21	59	80

There were 3 equivocal results with the assay. For purposes of calculation, these results were considered to be negative.
- **Positive percent agreement: 95.2% (20/21)**
- **Negative percent agreement: 98.3% (58/59)**
- **Overall agreement: 97.5% (78/80)**

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⇨ Scl-70

Scl-70		PREDICATE FIDIS™ CONNECTIVE 10 K071210		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10	Pos	17	0	17
	Neg	0	63	63
	Total	17	63	80

There were 2 equivocal results with the assay. For purposes of calculation, these results were considered to be negative.
- **Positive percent agreement: 100% (17/17)**
- **Negative percent agreement: 100% (63/63)**
- **Overall agreement: 100% (80/80)**

⇨ Jo-1

Jo-1		PREDICATE FIDIS™ CONNECTIVE 10 K071210		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10	Pos	12	0	12
	Neg	0	68	68
	Total	12	68	80

There were 2 equivocal results with the assay. For purposes of calculation, these results were considered to be negative.
- **Positive percent agreement: 100% (12/12)**
- **Negative percent agreement: 100% (68/68)**
- **Overall agreement: 100% (80/80)**

⇨ CENP-B

CENP-B		PREDICATE FIDIS™ CONNECTIVE 10 K071210		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10	Pos	8	0	8
	Neg	0	72	72
	Total	8	72	80

There was 1 equivocal result with the assay. For purposes of calculation, this result was considered to be negative.
- **Positive percent agreement: 100% (8/8)**
- **Negative percent agreement: 100% (72/72)**
- **Overall agreement: 100% (80/80)**

⇨ Ribosomes

Ribosomes		PREDICATE FIDIS™ CONNECTIVE 10 K071210		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10	Pos	7	0	7
	Neg	0	73	73
	Total	7	73	80

There was 1 equivocal result with the assay. For purposes of calculation, this result was considered to be negative.
- **Positive percent agreement: 100% (7/7)**
- **Negative percent agreement: 100% (73/73)**
- **Overall agreement: 100% (80/80)**

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Table 2: Summary of performance agreement results

Antigenic Specificity		Positive percent agreement	Negative percent agreement	Overall agreement	EP12-A Chap 9.2.2.	EP12-A Chap 9.1.1.	EP12-A Chap 9.1.1.
		proportion	proportion	proportion	95%CI	95%CI For positive agreement	95%CI For negative agreement
dsDNA	equivocal results included with the test negative results	100%	98.4%	98.8%	87.8%-100%	NA	NA
	equivocal results included with the test positive results	100%	100%	100%	NA	81.6%-100%	94.3%-100
SSA 60 kDa	equivocal results included with the test negative results	100%	98.2%	98.8%	86.6%-100%	NA	NA
	equivocal results included with the test positive results	100%	100%	100%	NA	88.3%-100%	93%-100%
TRIM 21 (SSA 52 kDa)	equivocal results included with the test negative results	95.8%	100%	98.8%	86.7%-100%	NA	NA
	equivocal results included with the test positive results	100%	98.2%	98.8%	86.6%-100%	NA	NA
SSB	equivocal results included with the test negative results	100%	98.5%	98.8%	88.2%-100%	NA	NA
	equivocal results included with the test positive results	100%	100%	100%	NA	83.2%-100%	94.1%-100
Sm	equivocal results included with the test negative results	100%	100%	100%	NA	81.6%-100%	94.3%-100%
	equivocal results included with the test positive results	100%	100%	100%	NA	82.4%-100%	94.2%-100%
Sm/RNP	equivocal results included with the test negative results	100%	98.4%	98.8%	87.3%-100%	NA	NA
	equivocal results included with the test positive results	95.2%	98.3%	97.5%	85.8%-100%	NA	NA
Scl70	equivocal results included with the test negative results	100%	96.9%	97.5%	86.8%-100%	NA	NA
	equivocal results included with the test positive results	100%	100%	100%	NA	81.6%-100%	94.3%-100%
Jo1	equivocal results included with the test negative results	100%	100%	100%	NA	72.3%-100%	94.8%-100%
	equivocal results included with the test positive results	100%	100%	100%	NA	75.8%-100%	94.7%-100%
CENP-B	equivocal results included with the test negative results	100%	98.6%	98.8%	90.2%-100%	NA	NA
	equivocal results included with the test positive results	100%	100%	100%	NA	67.6%-100%	94.9%-100%
Ribosomes	equivocal results included with the test negative results	100%	100%	100%	NA	61.0%-100%	95.1%-100%
	equivocal results included with the test positive results	100%	100%	100%	NA	64.6%-100%	95.0%-100%

All of results show that **FIDIS™ CONNECTIVE 10** considered substantially equivalent to the predicate **K071210IS™ CONNECTIVE 10**

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7.3.Performance data for modified FIDIS™ CONNECTIVE 10 with CARIS™ (diluting/ dispensing Device)

a. Precision study

Precision of the assay was assessed in **using 6 samples for** each of 7 analytes (dsDNA, SS-A 60kDa & TRIM 21 (SS-A 52 kDa), SS-B, Sm, Sm/RNP, Jo-1 and CENP-B) and only in **using 5 samples** for Scl-70 and Ribosomes. Precision was determined by calculating the within-run (intra-assay) and the between-run (inter-assay).

- For within-run: 10 tests in a same run.
- For between-run: 5 runs, 1 test per run.

Table 3: Summary of CARIS™ precision results

Sample range	dsDNA, SS-A 60kDa & TRIM 21 (SS-A 52 kDa), SS-B, Sm, Sm/RNP, Scl-70, Jo-1 Ribosomes and Centromere analytes			
	Within-run		Between-run	
	Minimal %CV	Maximal %CV	Minimal %CV	Maximal %CV
≤ 29 AU/mL or IU/mL	8%	13%	6%	15%
30 to 400 AU/mL or IU/mL	3%	10%	2%	15%

b. Comparison studies (manual versus automated assay preparation steps)

bmd has compared the results obtained with **modified FIDIS™ CONNECTIVE 10** for **manual or automated (with CARIS™)**.assay preparation steps.

The study was performed on 80 samples characterized with the predicate test and the result repartition is described below:

- **77 samples were positive** for one or more parameters (see table 10)
- **3 negative samples**.

a. First set of measures based on included the equivocal results with the test negative results.

⇨ dsDNA

dsDNA		MODIFIED FIDIS™ CONNECTIVE 10 Manual Use		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10 With CARIS™	Pos	16	1	17
	Neg	0	63	63
	Total	16	64	80

There was 1 equivocal result with the assay. For purposes of calculation, this result was considered to be negative.
- **Positive percent agreement: 100% (16/16)**
- **Negative percent agreement: 98.4% (63/64)**
- **Overall agreement: 98.8% (79/80)**

⇨ SS-A 60kDa

SS-A 60kDa		MODIFIED FIDIS™ CONNECTIVE 10 Manual Use		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10 With CARIS™	Pos	26	1	27
	Neg	0	53	53
	Total	26	54	80

There were 3 equivocal results with the assay. For purposes of calculation, these results were considered to be negative.
- **Positive percent agreement: 100% (26/26)**
- **Negative percent agreement: 98.1% (53/54)**
- **Overall agreement: 98.8% (79/80)**

⇨ TRIM 21 (SS-A 52kDa)

TRIM 21 (SS-A 52kDa)		MODIFIED FIDIS™ CONNECTIVE 10 Manual Use		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10 With CARIS™	Pos	23	1	24
	Neg	0	56	56
	Total	23	57	80

There were 3 equivocal results with the assay. For purposes of calculation, these results were considered to be negative.
- **Positive percent agreement: 100% (22/22)**
- **Negative percent agreement: 98.3% (57/58)**
- **Overall agreement: 98.8% (79/80)**

⇨ SS-B

SS-B		MODIFIED FIDIS™ CONNECTIVE 10 Manual Use		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10 With CARIS™	Pos	15	0	15
	Neg	0	65	65
	Total	15	65	80

There were 4 equivocal results with the assay. For purposes of calculation, these results were considered to be negative.
- **Positive percent agreement: 100% (15/15)**
- **Negative percent agreement: 100% (65/65)**
- **Overall agreement: 100% (80/80)**

⇨ Sm

Sm		MODIFIED FIDIS™ CONNECTIVE 10 Manual Use		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10 With CARIS™	Pos	16	1	17
	Neg	0	63	63
	Total	16	64	80

There was 1 equivocal result with the assay. For purposes of calculation, this result was considered to be negative.
- **Positive percent agreement: 100% (16/16)**
- **Negative percent agreement: 98.4% (63/64)**
- **Overall agreement: 98.8% (79/80)**

⇨ Sm/RNP

Sm/RNP		MODIFIED FIDIS™ CONNECTIVE 10 Manual Use		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10 With CARIS™	Pos	20	0	20
	Neg	0	60	60
	Total	20	60	80

There was 1 equivocal result with the assay. For purposes of calculation, this result was considered to be negative.
- **Positive percent agreement: 100% (20/20)**
- **Negative percent agreement: 100% (60/60)**
- **Overall agreement: 100% (80/80)**

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⇨ Scl-70

Scl-70		MODIFIED FIDIS™ CONNECTIVE 10 Manual Use		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10 With CARIS™	Pos	15	2	17
	Neg	0	63	63
	Total	15	65	80

There were 2 equivocal results with the assay. For purposes of calculation, these results were considered to be negative.

- **Positive percent agreement: 100% (15/15)**
- **Negative percent agreement: 96.9% (63/65)**
- **Overall agreement: 97.5% (78/80)**

⇨ Jo-1

Jo-1		MODIFIED FIDIS™ CONNECTIVE 10 Manual Use		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10 With CARIS™	Pos	10	0	10
	Neg	0	70	70
	Total	10	70	80

There were 2 equivocal results with the assay. For purposes of calculation, these results were considered to be negative.

- **Positive percent agreement: 100% (10/10)**
- **Negative percent agreement: 100% (70/70)**
- **Overall agreement: 100% (80/80)**

⇨ CENP-B

CENP-B		MODIFIED FIDIS™ CONNECTIVE 10 Manual Use		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10 With CARIS™	Pos	8	0	8
	Neg	0	72	72
	Total	8	72	80

There was 1 equivocal result with the assay. For purposes of calculation, this result was considered to be negative.

- **Positive percent agreement: 100% (8/8)**
- **Negative percent agreement: 100% (72/72)**
- **Overall agreement: 100% (80/80)**

⇨ Ribosomes

Ribosomes		MODIFIED FIDIS™ CONNECTIVE 10 Manual Use		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10 With CARIS™	Pos	6	0	6
	Neg	0	74	74
	Total	6	74	80

There was 1 equivocal result with the assay. For purposes of calculation, this result was considered to be negative.

- **Positive percent agreement: 100% (6/6)**
- **Negative percent agreement: 100% (74/74)**
- **Overall agreement: 100% (80/80)**

b. Second set of measures based on included the equivocal results with the test positive results.

⇨ dsDNA

dsDNA		MODIFIED FIDIS™ CONNECTIVE 10 Manual Use		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10 With CARIS™	Pos	17	0	17
	Neg	0	63	63
	Total	17	63	80

There was 1 equivocal result with the assay. For purposes of calculation, this result is considered to be positive.
- **Positive percent agreement: 100% (17/17)**
- **Negative percent agreement: 100% (63/63)**
- **Overall agreement: 100% (80/80)**

⇨ SS-A 60kDa

SS-A 60kDa		MODIFIED FIDIS™ CONNECTIVE 10 Manual Use		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10 With CARIS™	Pos	29	0	29
	Neg	0	51	51
	Total	29	51	80

There were 3 equivocal results with the assay. For purposes of calculation, these results were considered to be negative.
- **Positive percent agreement: 100% (29/29)**
- **Negative percent agreement: 100% (51/51)**
- **Overall agreement: 100% (80/80)**

⇨ TRIM 21 (SS-A 52kDa)

TRIM 21 (SS-A 52kDa)		MODIFIED FIDIS™ CONNECTIVE 10 Manual Use		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10 With CARIS™	Pos	26	0	26
	Neg	0	54	54
	Total	26	54	80

There were 3 equivocal results with the assay. For purposes of calculation, these results were considered to be negative.
- **Positive percent agreement: 100% (26/26)**
- **Negative percent agreement: 100% (54/54)**
- **Overall agreement: 100% (80/80)**

⇨ SS-B

SS-B		MODIFIED FIDIS™ CONNECTIVE 10 Manual Use		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10 With CARIS™	Pos	17	2	19
	Neg	0	61	61
	Total	17	63	80

There were 4 equivocal results with the assay. For purposes of calculation, these results were considered to be negative.
- **Positive percent agreement: 100% (17/17)**
- **Negative percent agreement: 96.8% (61/63)**
- **Overall agreement: 97.5% (78/80)**

⇨ Sm

Sm		MODIFIED FIDIS™ CONNECTIVE 10 Manual Use		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10 With CARIS™	Pos	17	0	17
	Neg	0	63	63
	Total	17	63	80

There was 1 equivocal result with the assay. For purposes of calculation, this result is considered to be positive.
- **Positive percent agreement: 100% (17/17)**
- **Negative percent agreement: 100% (63/63)**
- **Overall agreement: 100% (80/80)**

⇨ Sm/RNP

Sm/RNP		MODIFIED FIDIS™ CONNECTIVE 10 Manual Use		
		Pos	Neg	Total
MODIFIED FIDIS™ CONNECTIVE 10 With CARIS™	Pos	20	0	20
	Neg	1	59	60
	Total	21	59	80

There was 1 equivocal result with the assay. For purposes of calculation, this result is considered to be positive.
- **Positive percent agreement: 95.2% (20/21)**
- **Negative percent agreement: 100% (59/59)**
- **Overall agreement: 98.8% (79/80)**

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⇨ Scl-70

Scl-70		Modified FIDIS™ CONNECTIVE 10 Manual Use		
		Pos	Neg	Total
Modified FIDIS™ CONNECTIVE 10 With CARIS™	Pos	17	0	17
	Neg	0	63	63
	Total	17	63	80

There were 2 equivocal results with the assay. For purposes of calculation, these results were considered to be negative.

- **Positive percent agreement: 100% (17/17)**
- **Negative percent agreement: 100% (63/63)**
- **Overall agreement: 100% (80/80)**

⇨ Jo-1

Jo-1		Modified FIDIS™ CONNECTIVE 10 Manual Use		
		Pos	Neg	Total
Modified FIDIS™ CONNECTIVE 10 With CARIS™	Pos	12	0	12
	Neg	0	68	68
	Total	12	68	80

There were 2 equivocal results with the assay. For purposes of calculation, these results were considered to be negative.

- **Positive percent agreement: 100% (12/12)**
- **Negative percent agreement: 100% (68/68)**
- **Overall agreement: 100% (80/80)**

⇨ CENP-B

CENP-B		Modified FIDIS™ CONNECTIVE 10 Manual Use		
		Pos	Neg	Total
Modified FIDIS™ CONNECTIVE 10 With CARIS™	Pos	8	1	9
	Neg	0	71	71
	Total	8	72	80

There was 1 equivocal result with the assay. For purposes of calculation, this result was considered to be negative.

- **Positive percent agreement: 100% (8/8)**
- **Negative percent agreement: 98.6% (71/72)**
- **Overall agreement: 98.8% (79/80)**

⇨ Ribosomes

Ribosomes		Modified FIDIS™ CONNECTIVE 10 Manual Use		
		Pos	Neg	Total
Modified FIDIS™ CONNECTIVE 10	Pos	7	0	7
	Neg	0	73	73
	Total	7	73	80

There was 1 equivocal result with the assay. For purposes of calculation, this result was considered to be negative.

- **Positive percent agreement: 100% (7/7)**
- **Negative percent agreement: 100% (73/73)**
- **Overall agreement: 100% (80/80)**

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Table 4: Summary of performance agreements results obtained with CARIS™ versus manual

Antigenic Specificity		Positive percent agreement	Negative percent agreement	Overall agreement	EP12-A Chap 9.2.2.	EP12-A Chap 9.1.1.	EP12-A Chap 9.1.1.
		proportion	proportion	proportion	95%CI	95%CI For positive agreement	95%CI For negative agreement
dsDNA	equivocal results included with the test negative results	100%	98.4%	98.8%	87.8%-100%	NA	NA
	equivocal results included with the test positive results	100%	100%	100%	NA	81.6%-100%	94.3%-100
SSA 60 kDa	equivocal results included with the test negative results	100%	98.1%	98.8%	86.5%-100%	NA	NA
	equivocal results included with the test positive results	100%	100%	100%	NA	88.3%-100%	93%-100%
TRIM 21 (SSA 52 kDa)	equivocal results included with the test negative results	100%	98.3%	98.8%	86.8%-100%	NA	NA
	equivocal results included with the test positive results	100%	100%	100%	NA	87.1%-100%	93.4%-100
SSB	equivocal results included with the test negative results	100%	100%	100%	NA	79.6%-100%	94.4%-100%
	equivocal results included with the test positive results	100%	96.8%	97.5%	86.5%-100%	NA	NA
Sm	equivocal results included with the test negative results	100%	98.4%	98.8%	87.8%-100%	NA	NA
	equivocal results included with the test positive results	100%	100%	100%	NA	81.6%-100%	94.3%-100%
Sm/RNP	equivocal results included with the test negative results	100%	100%	100%	NA	83.9%-100%	94.0%-100%
	equivocal results included with the test positive results	95.2%	100%	98.8%	87%-100%	NA	NA
Scl70	equivocal results included with the test negative results	100%	96.9%	97.5%	86.8%-100%	NA	NA
	equivocal results included with the test positive results	100%	100%	100%	NA	81.6%-100%	94.3%-100%
Jo1	equivocal results included with the test negative results	100%	100%	100%	NA	72.3%-100%	94.8%-100%
	equivocal results included with the test positive results	100%	100%	100%	NA	75.8%-100%	94.7%-100%
CENP-B	equivocal results included with the test negative results	100%	100%	100%	NA	67.6%-100%	94.9%-100%
	equivocal results included with the test positive results	100%	98.6%	98.8%	89.8%-100%	NA	NA
Ribosomes	equivocal results included with the test negative results	100%	100%	100%	NA	61.0%-100%	95.1%-100%
	equivocal results included with the test positive results	100%	100%	100%	NA	64.6%-100%	95.0%-100%

All of previous evaluations results indicate that **manual** and **automated** (with CARIS™) assay preparation steps are considered substantially equivalents.

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8) Conclusions

=> In conclusion, all supporting data demonstrate that the **FIDIS™ CONNECTIVE 10 system** can be considered substantially equivalent to the predicate device.
=> All comparative studies indicate that manual and automated **(with CARIS™)** assays provide results that are statistically comparable.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food & Drug Administration
10903 New Hampshire Avenue
Building 66
Silver Spring, MD 20993

Biomedical Diagnostics (bmd) S.A
c/o Ms. Christelle Courivaud
Regulatory Manager
Actipole 25, 4-6 bd de Beaubourg
77435 Marne-La-Vallée Cedex 2
FRANCE

DEC 03 2010

Re: k102607
Trade/Device Name: FIDIS™ CONNECTIVE 10
Regulation Number: 21 CFR §866.5100
Regulation Name: Antinuclear Antibody, immunological test systems
Regulatory Class: Class II
Product Codes: LLL, LKJ, LKO, LKP, LSW, LJM, MQA
Dated: October 29, 2010
Received: November 1, 2010

Dear Ms. Courivaud:

We have reviewed your Section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration.

If your device is classified (see above) into class II (Special Controls), it may be subject to such additional controls. Existing major regulations affecting your device can be found in Title 21, Code of Federal Regulations (CFR), Parts 800 to 895. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act

or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Parts 801 and 809); medical device reporting (reporting of medical device-related adverse events) (21 CFR 803); and good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820). This letter will allow you to begin marketing your device as described in your Section 510(k) premarket notification. The FDA finding of substantial equivalence of your device to a legally marketed predicate device results in a classification for your device and thus, permits your device to proceed to the market.

If you desire specific advice for your device on our labeling regulation (21 CFR Parts 801 and 809), please contact the Office of *In Vitro* Diagnostic Device Evaluation and Safety at (301) 796-5450. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR Part 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to http://www.fda.gov/MedicalDevices/Safety/ReportaProblem/default.htm for the CDRH's Office of Surveillance and Biometrics/Division of Postmarket Surveillance.

You may obtain other general information on your responsibilities under the Act from the Division of Small Manufacturers, International and Consumer Assistance at its toll-free number (800) 638-2041 or (301) 796-7100 or at its Internet address http://www.fda.gov/cdrh/industry/support/index.html.

Sincerely yours,

for Maria Chan, Ph.D.
Director
Division of Immunology and Hematology Devices
Office of *In Vitro* Diagnostic Device
Evaluation and Safety
Center for Devices and Radiological Health

Enclosure

Indication for Use

510(k) Number (if known): k102607

DEC - 3 2010

Device Name: **FIDIS™ CONNECTIVE 10**

Indication For Use:

The **FIDIS™ CONNECTIVE 10*** kit is a semi-quantitative homogeneous fluorescent-based microparticles immunoassay using flow cytometry. The test system is used to simultaneously detect the presence of 10 autoantibody specificities: double stranded DNA (dsDNA), SS-A (60kDa and TRIM 21 (SS-A 52kDa)), SS-B, Sm, Sm/RNP, Scl-70, Jo-1, ribosomes and centromere (CENP-B).

*(*Antibodies to dsDNA, Sm, Sm/RNP, SS-A, SS-B, Scl-70, Jo-1, ribosomes and CENP-B can be reported using this assay).*

Clinical utility:

The results of the **FIDIS™ CONNECTIVE 10** are to be used in conjunction with the clinical findings and the other laboratory tests to aid in the diagnosis of connective diseases (systemic lupus erythematosus (SLE), Sjogren's syndrome, mixed connective tissue disease (MCTD), scleroderma, dermatomyositis and CREST syndrome).

FIDIS™ CONNECTIVE 10 kit uses serum only, and is to be run on the FIDIS™ Instrument and MLX-BOOSTER™ Software.

FIDIS™ CONNECTIVE 10 kit may be used with the **CARIS™ system** (diluting and dispensing device).

This kit is for *In vitro* Diagnostic Use.

Prescription Use __X__ (21 CFR Part 801 Subpart D) And/Or Over the Counter Use ____. (21 CFR Part 801 Subpart C)

(PLEASE DO NOT WRITE BELOW THIS LINE; CONTINUE ON ANOTHER PAGE IF NEEDED)

Concurrence of CDRH, Office of In Vitro Diagnostic Device Evaluation and Safety (OIVD)

Division Sign-Off
Office of In Vitro Diagnostic Device
Evaluation and Safety